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DOCKET SECTION

The attached file contains the Rolls-Royce comments on the NPRM on Bird Ingestion

M C Sanders



MCS99050.doc

OFFICE OF THE  
CHIEF COUNSEL  
RULES DOCKET  
1999 MAR 11 P 1:10

**ROLLS-ROYCE COMMENTS ON THE NPRM ON  
BIRD INGESTION DOCKET NO. FAA-1998-481 5**

1. While we support the increased stringency introduced by the proposal, we believe that the position put forward by the JAA (see Background Section – Disposition of Minority Position) may have some merit and should not be dismissed lightly.

Engines tested to the current **41b** large bird standard will all, as a minimum, have been able to demonstrate a safe shutdown during their certification. This means that in service today there could be a spectrum of engines in this respect ranging from those which would lose a fan blade as a result of a 41b birdstrike, to those where the same encounter would have little effect on an engine's performance. It is the experience of this complete spectrum of engines which has created the 'marginally acceptable' in-service multiple shutdown risk for birds greater than 2.5 lb as identified in the Industry database. Clearly then, since the objective of this new rulemaking is to ensure that the probability of a dual engine shutdown is improved to  $10^{-8}$  per aircraft departure for the total bird threat, future engines must be at least as capable at the 41b level as those in service today. If they were not; then the implication is that the  $10^{-8}$  probability could not be achieved. While individual manufacturers may be able to demonstrate that an engine's capability at 41b is at least as good as their earlier designs, there is nothing in the proposed rule that demands such a demonstration. We believe it is simply this omission that is lacking from the NPRM.

The **JAA's** attempt to define an acceptable result of a 41b bird test in terms of blade out-of-balance is not justifiable against any safety-based criteria and does not equate to an engines ability to deliver an acceptable level of thrust. Nevertheless, the challenge is to ensure that manufacturers demonstrate that new designs result in birdstrike capabilities at least as good as those whose experience has created the birdstrike database.

2. Note one omission from Table 2 (Page 68645). The figure 4.5 is missing from the last but one line.

M C Sanders  
On behalf of Rolls-Royce plc